

FIG.1

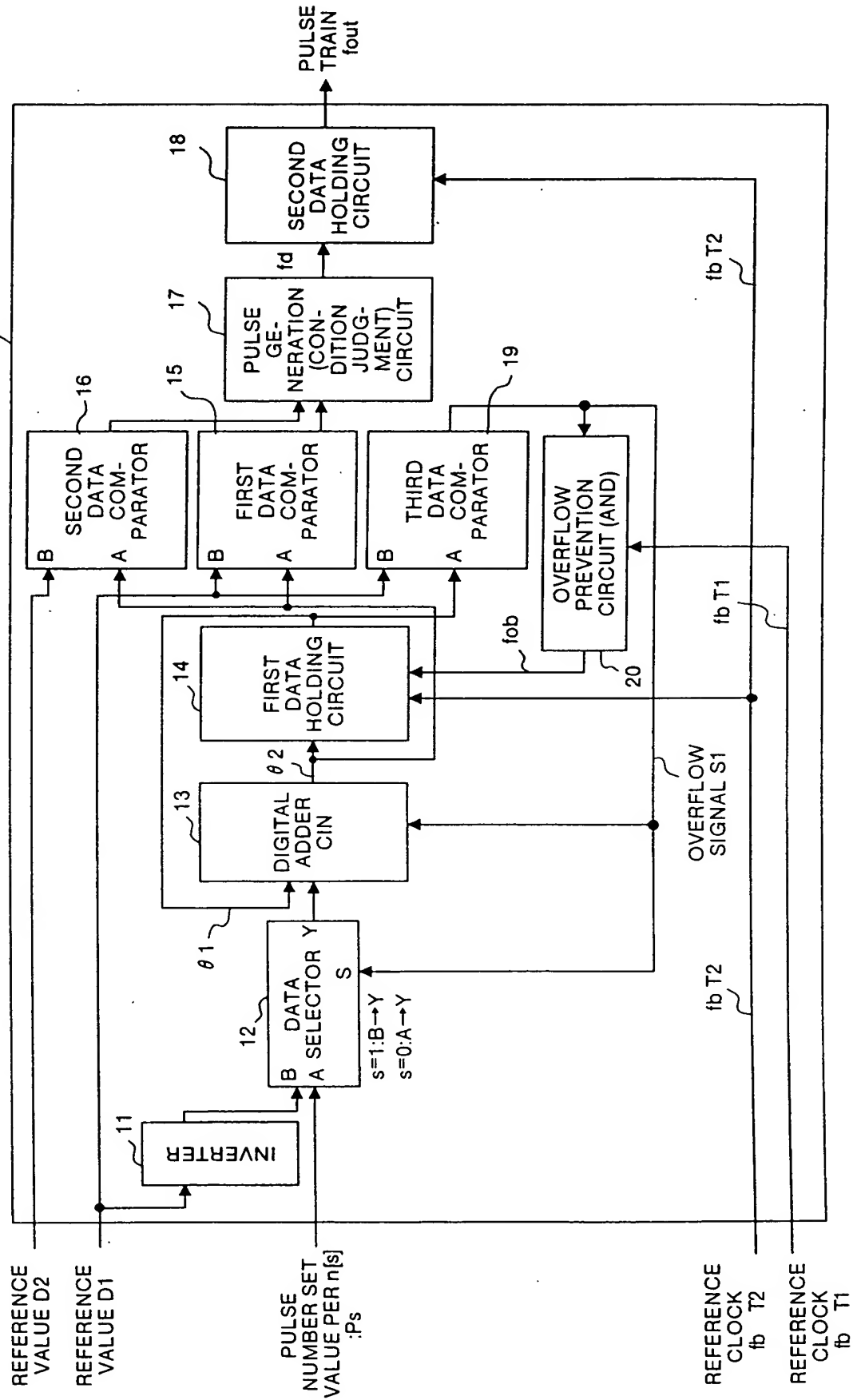


FIG.2

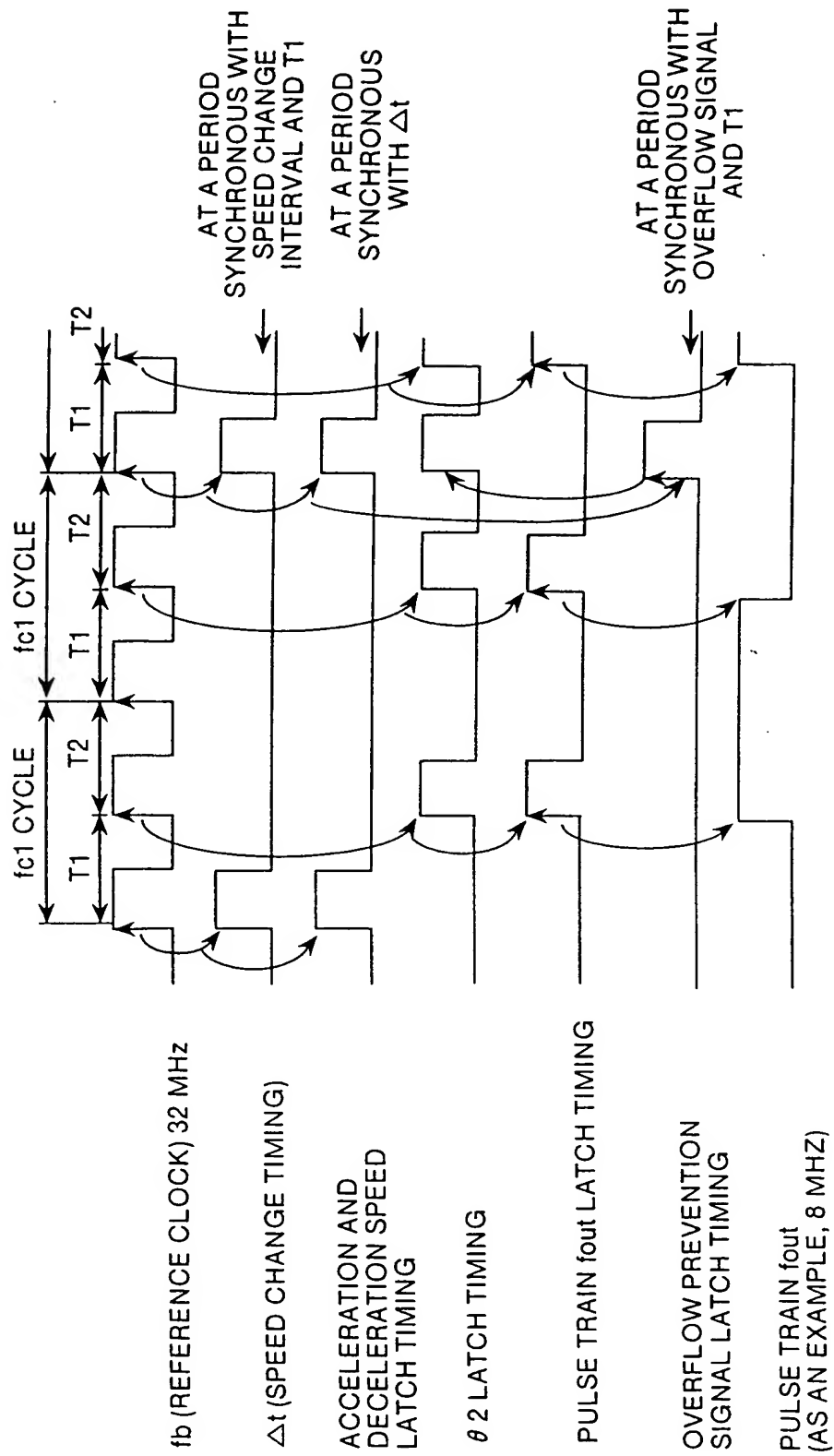


FIG.3

ELAPSED TIME [S]	$V_p \times n [Hz \times n]$	OUTPUT VALUE $\theta 1$ OF FIRST DATA HOLDING CIRCUIT 14	OVERFLOW SIGNAL $\theta 1 \geq$ D1 WHEN 1	OUTPUT VALUE $\theta 2$ OF DIGITAL ADDER 13	VALUE f_d	VALUE f_{out} (LATCHED AT T2)
0/32,000,000	0 (INITIAL VALUE)	0 (INITIAL VALUE)	0 (INITIAL VALUE)	0 (INITIAL VALUE)	0 (INITIAL VALUE)	0 (INITIAL VALUE)
1/32,000,000 (T1)	8,000,000	0	0	$\theta 1 + V_p \times n = 8,000,000$	0	0
2/32,000,000 (T2)	8,000,000	$\theta 2$ IMMEDIATELY BEFORE = 8,000,000	0	$\theta 1 + V_p \times n = 16,000,000$	1	f_d IMMEDIATELY BEFORE = 0
3/32,000,000 (T1)	8,000,000	HOLD PREVIOUS $\theta 1$ = 8,000,000	0	$\theta 1 + V_p \times n = 16,000,000$	1	0
4/32,000,000 (T2)	8,000,000	$\theta 2$ IMMEDIATELY BEFORE = 16,000,000	0	$\theta 1 + V_p \times n = 24,000,000$	1	f_d IMMEDIATELY BEFORE = 1
5/32,000,000 (T1)	8,000,000	HOLD PREVIOUS $\theta 1$ = 16,000,000	0	$\theta 1 + V_p \times n = 24,000,000$	1	1
6/32,000,000 (T2)	8,000,000	$\theta 2$ IMMEDIATELY BEFORE = 24,000,000	0	$\theta 1 + V_p \times n = 32,000,000$	0	f_d IMMEDIATELY BEFORE = 1
7/32,000,000 (T1)	8,000,000	HOLD PREVIOUS $\theta 1$ = 24,000,000	0	$\theta 1 + V_p \times n = 32,000,000$	0	1
8/32,000,000 (T2)	8,000,000	$\theta 2$ IMMEDIATELY BEFORE = 32,000,000	1	$\theta 1 - D1 = 0$	0	f_d IMMEDIATELY BEFORE = 0
9/32,000,000 (T1)	16,000,000	$\theta 2$ IMMEDIATELY BEFORE = 0	0	$\theta 1 + V_p \times n = 16,000,000$	1	0
10/32,000,000 (T2)	16,000,000	$\theta 2$ IMMEDIATELY BEFORE = 16,000,000	0	$\theta 1 + V_p \times n = 32,000,000$	0	f_d IMMEDIATELY BEFORE = 1
11/32,000,000 (T1)	16,000,000	HOLD PREVIOUS $\theta 1$ = 16,000,000	0	$\theta 1 + V_p \times n = 32,000,000$	0	1
12/32,000,000 (T2)	16,000,000	$\theta 2$ IMMEDIATELY BEFORE = 32,000,000	1	$\theta 1 - D1 = 0$	0	f_d IMMEDIATELY BEFORE = 0
13/32,000,000 (T1)	16,000,000	$\theta 2$ IMMEDIATELY BEFORE = 0	0	$\theta 1 + V_p \times n = 16,000,000$	1	0
14/32,000,000 (T2)	16,000,000	$\theta 2$ IMMEDIATELY BEFORE = 16,000,000	0	$\theta 1 + V_p \times n = 32,000,000$	0	f_d IMMEDIATELY BEFORE = 1
15/32,000,000 (T1)	16,000,000	HOLD PREVIOUS $\theta 1$ = 16,000,000	0	$\theta 1 + V_p \times n = 32,000,000$	0	1
16/32,000,000 (T2)	16,000,000	$\theta 2$ IMMEDIATELY BEFORE = 32,000,000	1	$\theta 1 - D1 = 0$	0	f_d IMMEDIATELY BEFORE = 0

FIG.4

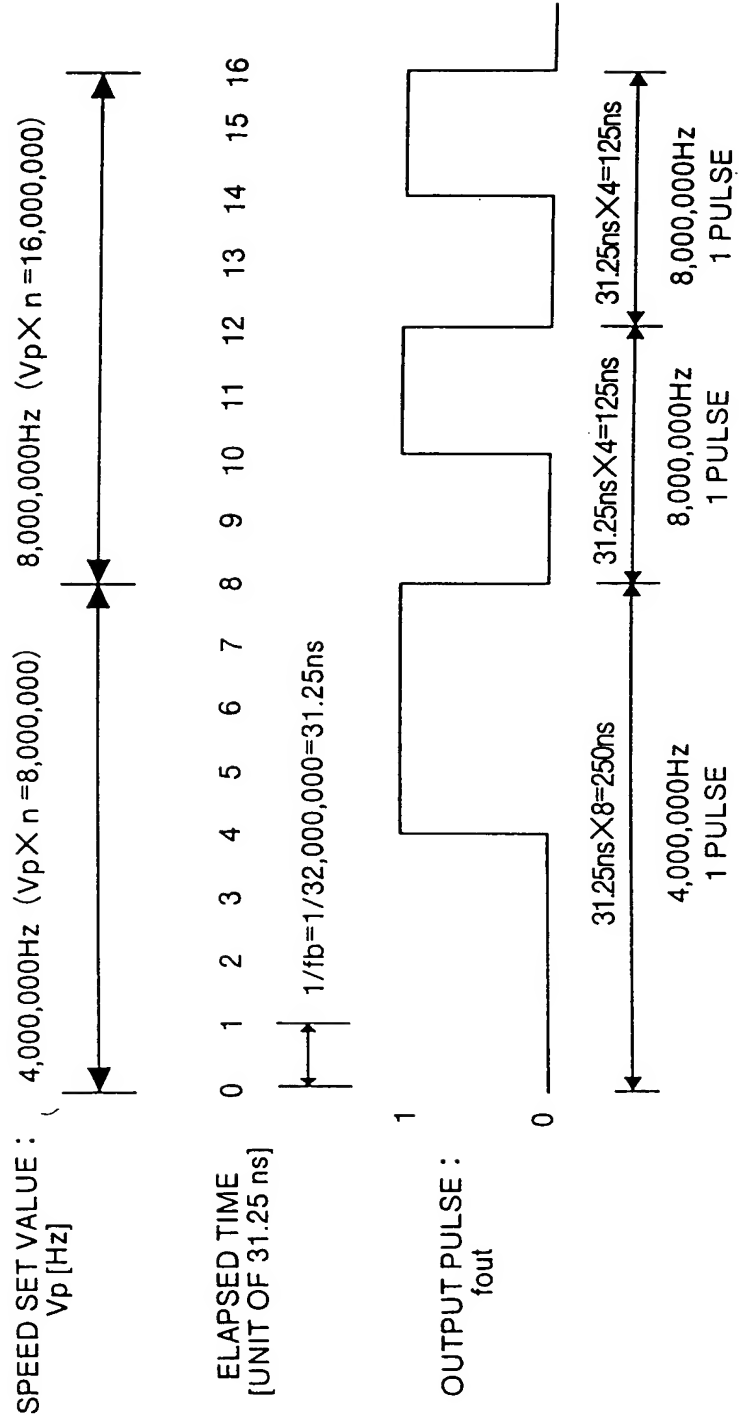


FIG.5

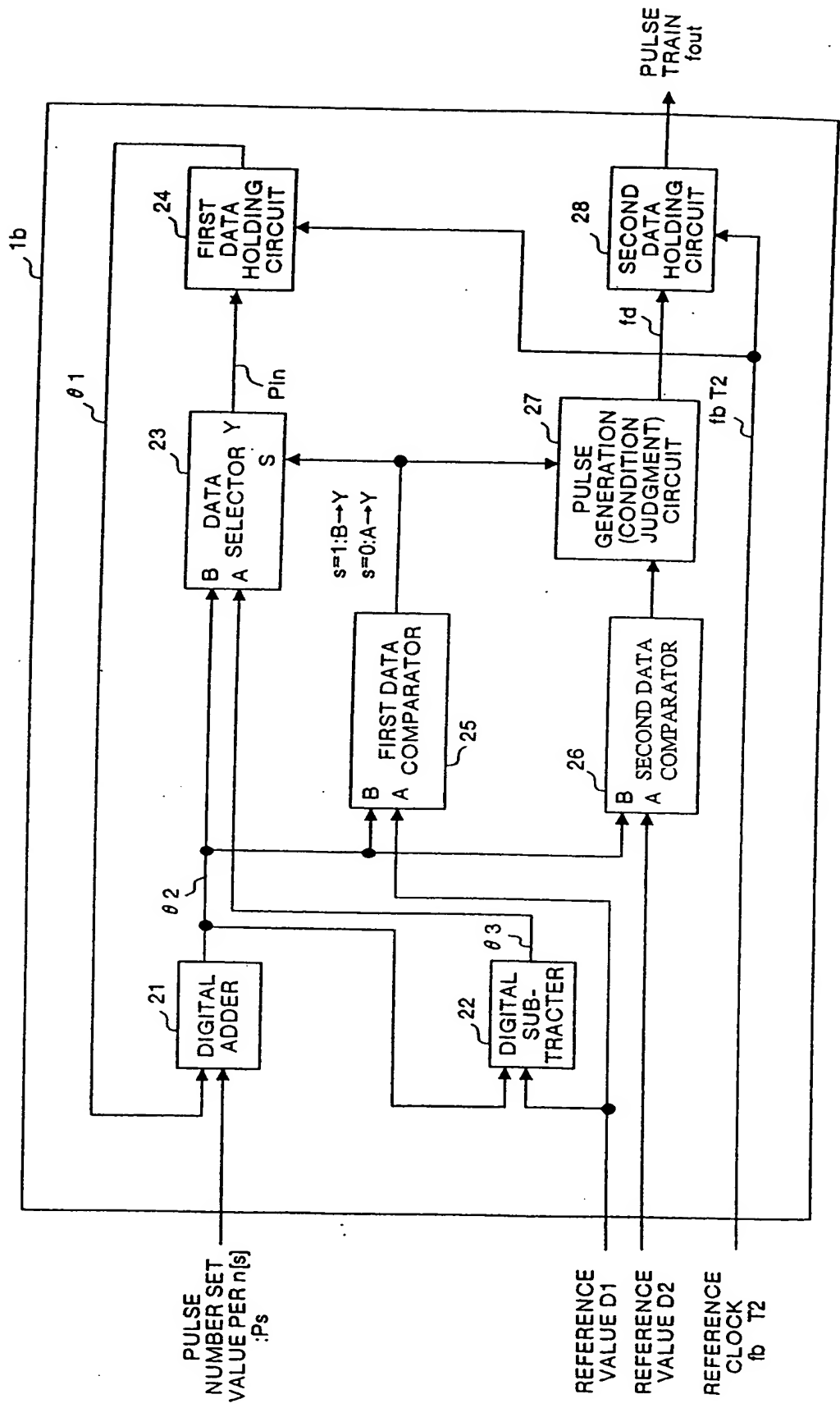


FIG.6

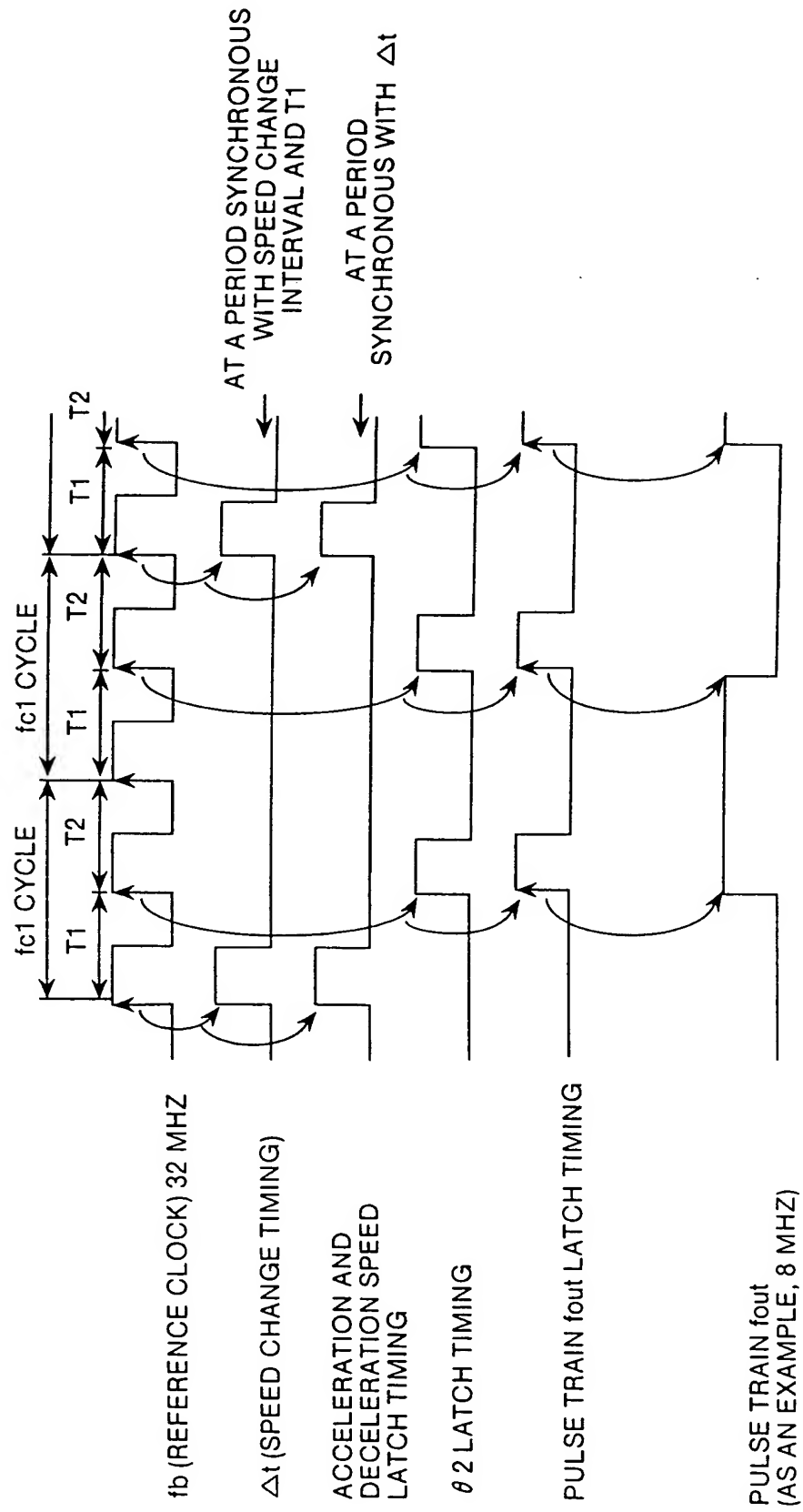


FIG.7

ELAPSED TIME [S]	$Vp \times n [Hz \times n]$	OUTPUT VALUE $\theta 1$ OF FIRST DATA HOLDING CIRCUIT 14	OUTPUT VALUE OF DIGITAL ADDER 21 $\theta 1 + Vp \times n = \theta 2$	OUTPUT VALUE OF DIGITAL SUBTRACTER 22 $\theta 2 - D1 = \theta 3$	VALUE PIN $\theta 2$ OR $\theta 3$	VALUE f_d	VALUE FOUT (LATCHED AT T2)
0/32,000,000	0 (INITIAL VALUE)	0 (INITIAL VALUE)	0 (INITIAL VALUE)	0 (INITIAL VALUE)	0 (INITIAL VALUE)	0 (INITIAL VALUE)	0 (INITIAL VALUE)
1/32,000,000 (T1)	8,000,000	0	8,000,000	-24,000,000	$\theta 2$	0	0
2/32,000,000 (T2)	8,000,000	PIN IMMEDIATELY BEFORE = 8,000,000	16,000,000	-16,000,000	$\theta 2$	1	f_d IMMEDIATELY BEFORE = 0
3/32,000,000 (T1)	8,000,000	HOLD PREVIOUS $\theta 1$ = 8,000,000	16,000,000	-16,000,000	$\theta 2$	1	0
4/32,000,000 (T2)	8,000,000	PIN IMMEDIATELY BEFORE = 16,000,000	24,000,000	-8,000,000	$\theta 2$	1	f_d IMMEDIATELY BEFORE = 1
5/32,000,000 (T1)	8,000,000	HOLD PREVIOUS $\theta 1$ = 16,000,000	24,000,000	-8,000,000	$\theta 2$	1	1
6/32,000,000 (T2)	8,000,000	PIN IMMEDIATELY BEFORE = 24,000,000	32,000,000	0	$\theta 3$	0	f_d IMMEDIATELY BEFORE = 1
7/32,000,000 (T1)	8,000,000	HOLD PREVIOUS $\theta 1$ = 24,000,000	32,000,000	0	$\theta 3$	0	1
8/32,000,000 (T2)	8,000,000	PIN IMMEDIATELY BEFORE = 0	8,000,000	-24,000,000	$\theta 2$	0	f_d IMMEDIATELY BEFORE = 0
9/32,000,000 (T1)	16,000,000	HOLD PREVIOUS $\theta 1$ = 0	16,000,000	-16,000,000	$\theta 2$	1	0
10/32,000,000 (T2)	16,000,000	PIN IMMEDIATELY BEFORE = 16,000,000	32,000,000	0	$\theta 3$	0	f_d IMMEDIATELY BEFORE = 1
11/32,000,000 (T1)	16,000,000	HOLD PREVIOUS $\theta 1$ = 16,000,000	32,000,000	0	$\theta 3$	0	1
12/32,000,000 (T2)	16,000,000	PIN IMMEDIATELY BEFORE = 0	16,000,000	-16,000,000	$\theta 2$	1	f_d IMMEDIATELY BEFORE = 0
13/32,000,000 (T1)	16,000,000	HOLD PREVIOUS $\theta 1$ = 0	16,000,000	-16,000,000	$\theta 2$	1	0
14/32,000,000 (T2)	16,000,000	PIN IMMEDIATELY BEFORE = 16,000,000	32,000,000	0	$\theta 3$	0	f_d IMMEDIATELY BEFORE = 1
15/32,000,000 (T1)	16,000,000	HOLD PREVIOUS $\theta 1$ = 16,000,000	32,000,000	0	$\theta 3$	0	1
16/32,000,000 (T2)	16,000,000	PIN IMMEDIATELY BEFORE = 0	16,000,000	-16,000,000	$\theta 2$	1	f_d IMMEDIATELY BEFORE = 0

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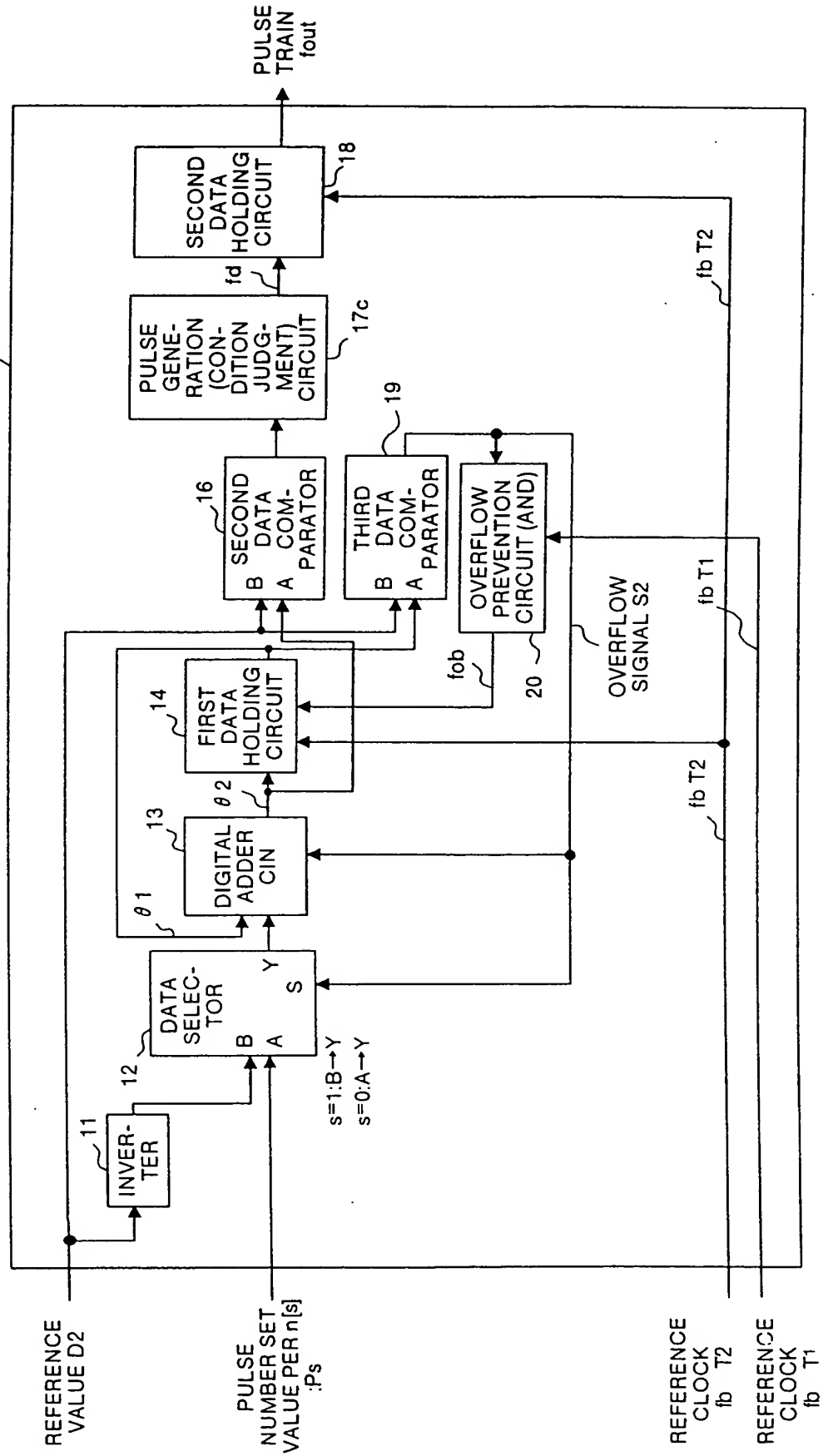


FIG.9

ELAPSED TIME [S]	$V_p \times n [Hz \times n]$	OUTPUT VALUE $\theta 1$ OF FIRST DATA HOLDING CIRCUIT 14	OVERFLOW SIGNAL $\theta 1 \geq$ D2 WHEN 1	OUTPUT VALUE $\theta 2$ OF DIGITAL ADDER 13	VALUE f_d	VALUE f_{out} (LATCHED AT T2)
0/32,000,000	0 (INITIAL VALUE)	0 (INITIAL VALUE)	0 (INITIAL VALUE)	0 (INITIAL VALUE)	0 (INITIAL VALUE)	0 (INITIAL VALUE)
1/32,000,000 (T1)	8,000,000	0	0	$\theta 1 + V_p \times n = 8,000,000$	0	0
2/32,000,000 (T2)	8,000,000	$\theta 2$ IMMEDIATELY BEFORE = 8,000,000	0	$\theta 1 + V_p \times n = 16,000,000$	1	f_d IMMEDIATELY BEFORE = 0
3/32,000,000 (T1)	8,000,000	HOLD PREVIOUS $\theta 1$ = 8,000,000	0	$\theta 1 + V_p \times n = 16,000,000$	1	0
4/32,000,000 (T2)	8,000,000	$\theta 2$ IMMEDIATELY BEFORE = 16,000,000	1 (ODD NUMBER OF TIMES)	$\theta 1 - D2 = 0$	1	f_d IMMEDIATELY BEFORE = 1
5/32,000,000 (T1)	8,000,000	$\theta 2$ IMMEDIATELY BEFORE = 0	0	$\theta 1 + V_p \times n = 8,000,000$	1	1
6/32,000,000 (T2)	8,000,000	$\theta 2$ IMMEDIATELY BEFORE = 8,000,000	0	$\theta 1 + V_p \times n = 16,000,000$	0	f_d IMMEDIATELY BEFORE = 1
7/32,000,000 (T1)	8,000,000	HOLD PREVIOUS $\theta 1$ = 8,000,000	0	$\theta 1 + V_p \times n = 16,000,000$	0	1
8/32,000,000 (T2)	8,000,000	$\theta 2$ IMMEDIATELY BEFORE = 16,000,000	1 (EVEN NUMBER OF TIMES)	$\theta 1 - D2 = 0$	0	f_d IMMEDIATELY BEFORE = 0
9/32,000,000 (T1)	16,000,000	$\theta 2$ IMMEDIATELY BEFORE = 0	0	$\theta 1 + V_p \times n = 16,000,000$	1	0
10/32,000,000 (T2)	16,000,000	$\theta 2$ IMMEDIATELY BEFORE = 16,000,000	1 (ODD NUMBER OF TIMES)	$\theta 1 - D2 = 0$	1	f_d IMMEDIATELY BEFORE = 1
11/32,000,000 (T1)	16,000,000	$\theta 2$ IMMEDIATELY BEFORE = 0	0	$\theta 1 + V_p \times n = 16,000,000$	0	1
12/32,000,000 (T2)	16,000,000	$\theta 2$ IMMEDIATELY BEFORE = 16,000,000	1 (EVEN NUMBER OF TIMES)	$\theta 1 - D2 = 0$	0	f_d IMMEDIATELY BEFORE = 0
13/32,000,000 (T1)	16,000,000	$\theta 2$ IMMEDIATELY BEFORE = 0	0	$\theta 1 + V_p \times n = 16,000,000$	1	0
14/32,000,000 (T2)	16,000,000	$\theta 2$ IMMEDIATELY BEFORE = 16,000,000	1 (ODD NUMBER OF TIMES)	$\theta 1 - D2 = 0$	1	f_d IMMEDIATELY BEFORE = 1
15/32,000,000 (T1)	16,000,000	$\theta 2$ IMMEDIATELY BEFORE = 0	0	$\theta 1 + V_p \times n = 16,000,000$	0	1
16/32,000,000 (T2)	16,000,000	$\theta 2$ IMMEDIATELY BEFORE = 16,000,000	1 (EVEN NUMBER OF TIMES)	$\theta 1 - D2 = 0$	0	f_d IMMEDIATELY BEFORE = 0

FIG.10

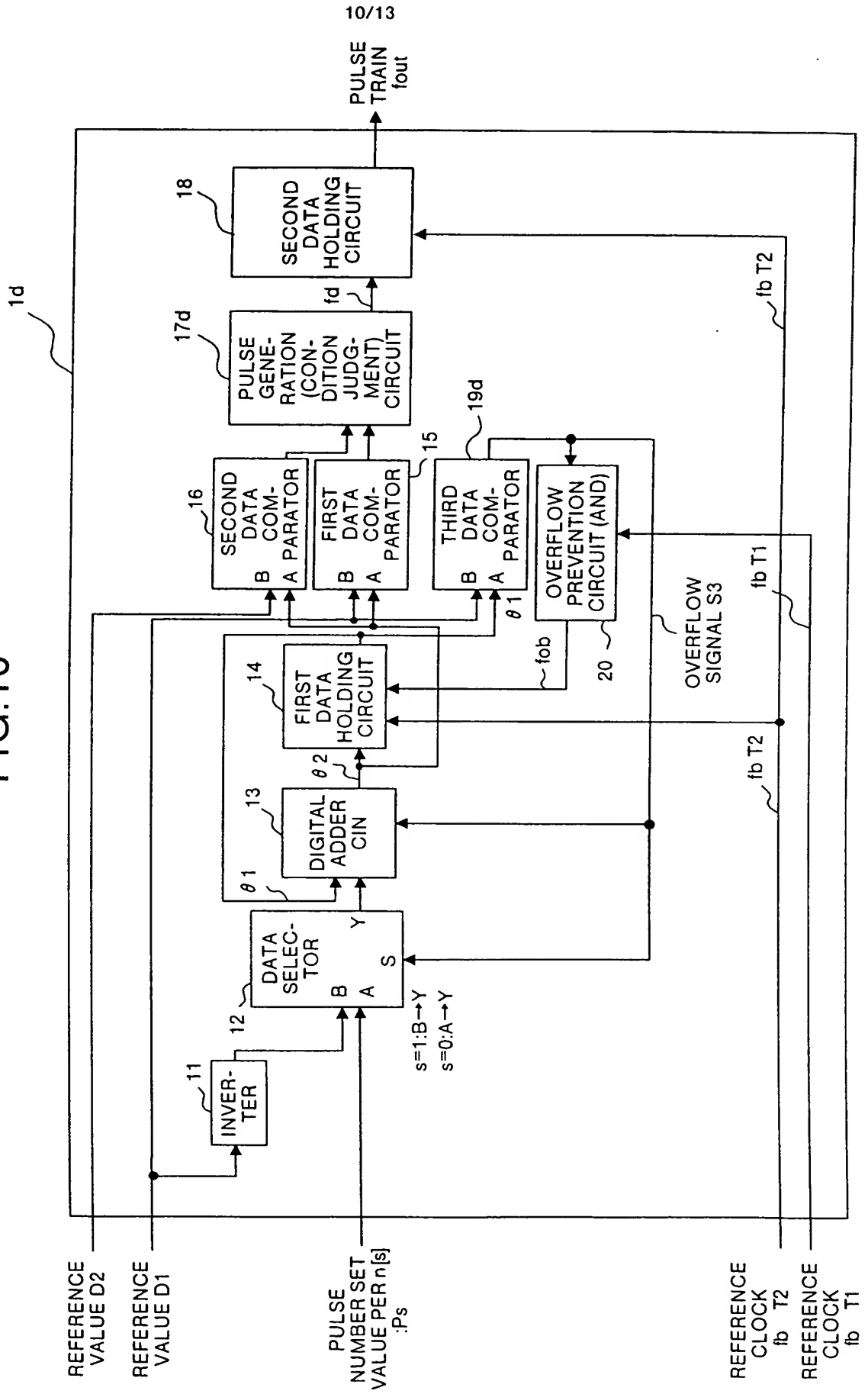


FIG.11

ELAPSED TIME [S]	$V_p \times n [Hz \times n]$	OUTPUT VALUE $\theta 1$ OF FIRST DATA HOLDING CIRCUIT 14	OVERFLOW SIGNAL $\theta 1 >$ D1 WHEN 1	OUTPUT VALUE $\theta 2$ OF DIGITAL ADDER 13	VALUE f_d	VALUE f_{out} (LATCHED AT T2)
0/32,000,000	0 (INITIAL VALUE)	0 (INITIAL VALUE)	0 (INITIAL VALUE)	0 (INITIAL VALUE)	0 (INITIAL VALUE)	0 (INITIAL VALUE)
1/32,000,000 (T1)	8,000,000	0	0	$\theta 1 + V_p \times n = 8,000,000$	0	0
2/32,000,000 (T2)	8,000,000	$\theta 2$ IMMEDIATELY BEFORE = 8,000,000	0	$\theta 1 + V_p \times n = 16,000,000$	1	f_d IMMEDIATELY BEFORE = 0
3/32,000,000 (T1)	8,000,000	HOLD PREVIOUS $\theta 1$ = 8,000,000	0	$\theta 1 + V_p \times n = 16,000,000$	1	0
4/32,000,000 (T2)	8,000,000	$\theta 2$ IMMEDIATELY BEFORE = 16,000,000	0	$\theta 1 + V_p \times n = 24,000,000$	1	f_d IMMEDIATELY BEFORE = 1
5/32,000,000 (T1)	8,000,000	HOLD PREVIOUS $\theta 1$ = 16,000,000	0	$\theta 1 + V_p \times n = 24,000,000$	1	1
6/32,000,000 (T2)	8,000,000	$\theta 2$ IMMEDIATELY BEFORE = 24,000,000	0	$\theta 1 + V_p \times n = 32,000,000$	0	f_d IMMEDIATELY BEFORE = 1
7/32,000,000 (T1)	8,000,000	HOLD PREVIOUS $\theta 1$ = 24,000,000	0	$\theta 1 + V_p \times n = 32,000,000$	0	1
8/32,000,000 (T2)	8,000,000	$\theta 2$ IMMEDIATELY BEFORE = 32,000,000	0	$\theta 1 + V_p \times n = 40,000,000$	0	f_d IMMEDIATELY BEFORE = 0
9/32,000,000 (T1)	16,000,000	HOLD PREVIOUS $\theta 1$ = 32,000,000	0	$\theta 1 + V_p \times n = 48,000,000$	1	0
10/32,000,000 (T2)	16,000,000	$\theta 2$ IMMEDIATELY BEFORE = 48,000,000	1	$\theta 1 - D1 = 16,000,000$	1	f_d IMMEDIATELY BEFORE = 1
11/32,000,000 (T1)	16,000,000	$\theta 2$ IMMEDIATELY BEFORE = 16,000,000	0	$\theta 1 + V_p \times n = 32,000,000$	0	1
12/32,000,000 (T2)	16,000,000	$\theta 2$ IMMEDIATELY BEFORE = 32,000,000	0	$\theta 1 + V_p \times n = 48,000,000$	1	f_d IMMEDIATELY BEFORE = 0
13/32,000,000 (T1)	16,000,000	HOLD PREVIOUS $\theta 1$ = 32,000,000	0	$\theta 1 + V_p \times n = 48,000,000$	1	0
14/32,000,000 (T2)	16,000,000	$\theta 2$ IMMEDIATELY BEFORE = 48,000,000	1	$\theta 1 - D1 = 16,000,000$	1	f_d IMMEDIATELY BEFORE = 1
15/32,000,000 (T1)	16,000,000	$\theta 2$ IMMEDIATELY BEFORE = 16,000,000	0	$\theta 1 + V_p \times n = 32,000,000$	0	1
16/32,000,000 (T2)	16,000,000	$\theta 2$ IMMEDIATELY BEFORE = 32,000,000	0	$\theta 1 + V_p \times n = 48,000,000$	1	f_d IMMEDIATELY BEFORE = 0

FIG.12

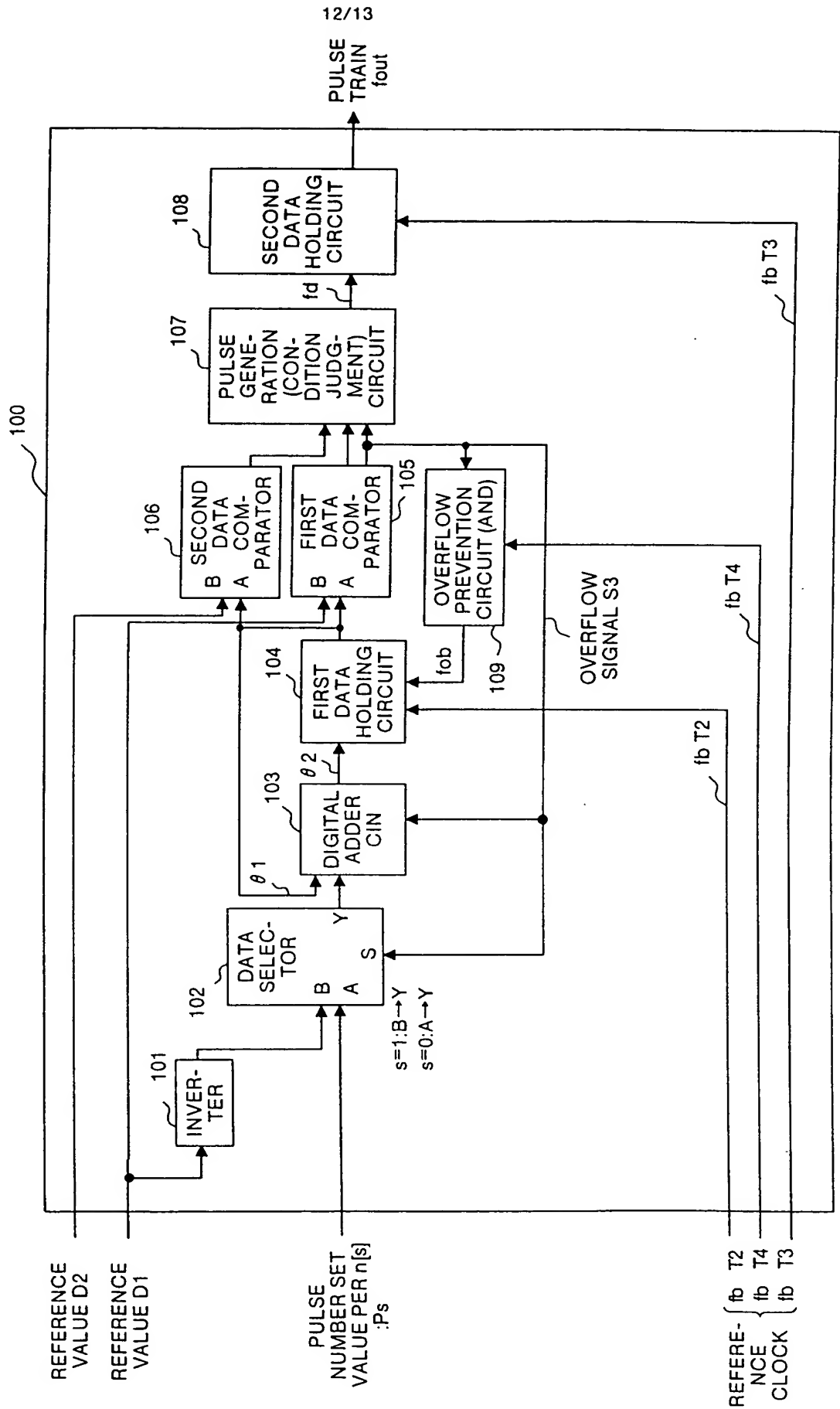


FIG.13

